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| 10/575,571 | 04/11/2006 | Wolfgang Brox | NL 031208 | 9555 |

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NXP, B.V.
NXP INTELLECTUAL PROPERTY DEPARTMENT
M/S41-SJ
1109 MCKAY DRIVE
SAN JOSE, CA 95131

| EXAMINER | |
|---|---|
| NGUYEN, THUAN V | |
| ART UNIT | PAPER NUMBER |
| 4145 | |

| NOTIFICATION DATE | DELIVERY MODE |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/575,571 | BROX, WOLFGANG | |
| | Examiner | Art Unit | |
| | THUAN NGUYEN | 4145 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *11 April 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-8 and 10* is/are rejected.

7)☒ Claim(s) *4 and 9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-3, 5, 6, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cason (US Patent 6,249,757) in view of Hoya (US 2004/0054528A1) and Etter (US patent 7,072,831).

3. As per claim 1, Cason teaches *an apparatus for detecting voice activity in a communication signal* (Cason, abstract)*, said apparatus comprising:*

*filter means* (Cason, figure 1, element 14) *for performing an estimation* (Cason, column 5, line 10) *or a suppression* (Cason, figure 1, element 18 shows the output of the filter 14 subtracted at element 18 from the communication signal) *of an offset component of the level of said communication signal* (Cason, column 5, lines 6-7 teaches that the

output of filter 14 is roughly constant, thus can be considered an offset component of the communication signal.)

Cason does not teach *parameter control means for controlling a filter parameter of said filter means based on an output of said filter means; and limitation means for limiting said suppression or said estimation of said offset component in response to said output of said filter means*.

However Hoya teaches *parameter control means for controlling a filter parameter of said filter means based on an output of said filter means* (Hoya, figure 7, element 20a shows an adaptive filter to separate noise from a communication signal. Hoya, paragraph [0076] teaches that a coefficient of filter 20a in figure 7 is updated based on the output of filter 20a.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *parameter control means for controlling a filter parameter of said filter means based on an output of said filter means* of Hoya into Cason, since Cason suggests a filter to estimate noise (something broad) in general, and Hoya suggests the beneficial use of updating the filter coefficients such as to estimate the noise level more closely in the analogous art of noise suppression in telecommunications.

Cason and Hoya do not teach *limitation means for limiting said suppression or said estimation of said offset component in response to said output of said filter means*.

However Etter teaches *limitation means for limiting said suppression or said estimation of said offset component in response to said output of said filter means* (Etter, figure 2 as explained in Etter, column 5, lines 33-36 and column 13, lines 41-42 teaches that the noise estimator of figure 2 includes two nonlinear filters followed by a rise-time limitation filter whose purpose is to place a limit on the maximum allowable rise of its output signal per unit of time.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *limitation means for limiting said suppression or said estimation of said offset component in response to said output of said filter means* of Etter into Cason and Hoya, since Cason and Hoya suggest a filter to estimate noise (something broad) in general, and Etter suggests the beneficial use of a limiter such as to estimate noise more accurately (Etter, column 13, lines 31-33) in the analogous art of noise suppression in telecommunications.

4. As per claim 2, Cason, Hoya and Etter teach claim 1. Cason also teaches *level calculation means for calculating a short-term level of said communication signal* (Cason, figure 1, element 12 as explained in column 4, lines 8-25 teaches that element 12 calculates the absolute value or the square of the input signal)*, and voice activity control means for comparing input and output levels of said filter means* (Cason, figure 1, element 18 calculates the difference between signal 13 and signal 15 then compares to threshold 23. Note that signal 15 is the output of filter 14, i.e. the filter means recited in claim 2, and signal 13 is the smoothened version of the input signal to filter 14 as explained in column 5, lines 25-29.)

5. As per claim 3, Cason, Hoya and Etter teach claim 1. Cason also teaches *said offset component is a noise floor component of the level of said communication signal* (Cason, column 5, line 10).

6. As per claim 5, Cason, Hoya and Etter teach claim 1. Cason also teaches *said filter means comprises a low-pass filter for extracting said offset component* (Cason, column 4, line 27). Etter also teaches *said limitation means comprises comparing means for comparing said extracted offset component with said communication signal* (Etter, figure 3, element 205) *and switching means for selecting one of said extracted offset component and said communication signal in response to an output of said comparing means* (Etter, figure 3, elements 217 and 215 select the input communication signal as the final noise estimate, while elements 207, 209, 211 and 215 select the noise estimate extracted from the limitation filter in figure 2 as the final noise estimate, depending on the output of comparing means 205).

7. As per claim 6, Cason, Hoya and Etter teach claim 1. Cason also teaches *said parameter control means are adapted to set said filter parameter to a first value which leads to a lower tracking speed of said estimation, if the level of said communication signal falls below the level of said estimated offset component* (Cason column 5, line 10 teaches the offset component is a noise floor estimate for the communication signal, therefore when the communication signal level falls below the offset component level it

is considered that there is only noise. In this case, Cason, column 5, lines 42-45 teaches that the filter should have a large time constant so that it can have a slow tracking speed)*, and to set said filter parameter to a second value which leads to a higher tracking speed of said estimation, if the level of said communication signal is higher than the level of said estimated offset component* (Cason column 5, line 10 teaches the offset component is a noise floor estimate for the communication signal, therefore when the communication signal level exceeds the offset component level it is considered that voice is present. In this case, Cason, column 5, lines 46-50 teaches that the filter should have a small time constant so that it can have a fast tracking speed).

8. As per claim 8, Cason teaches *a method of detecting voice activity in a communication signal* (Cason, abstract)*, said method comprising the steps of:*

*filtering* (Cason, figure 1, element 14) *an offset component of the level of said communication signal* (Cason, column 5, lines 6-7 teaches that the output of filter 14 is roughly constant, thus can be considered an offset component of the communication signal.)

Cason does not teach *controlling a filter parameter used in said filtering step, based on the result of said filtering step; and limiting said filtering step in response to the result of said filtering step.*

However Hoya teaches *controlling a filter parameter used in said filtering step, based on the result of said filtering step* (Hoya, figure 7, element 20a shows an adaptive filter to separate noise from a communication signal. Hoya, paragraph [0076] teaches that a coefficient of filter 20a in figure 7 is updated based on the output of filter 20a). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *controlling a filter parameter used in said filtering step, based on the result of said filtering step* of Hoya into Cason, since Cason suggests a filter to estimate noise (something broad) in general, and Hoya suggests the beneficial use of updating the filter coefficients such as to estimate the noise level more closely in the analogous art of noise suppression in telecommunications.

Cason and Hoya do not teach *and limiting said filtering step in response to the result of said filtering step*. However Etter teaches *and limiting said filtering step in response to the result of said filtering step* (Etter, figure 2 as explained in Etter, column 5, lines 33-36 and column 13, lines 41-42 teaches that the noise estimator of figure 2 includes two nonlinear filters followed by a rise-time limitation filter whose purpose is to place a limit on the maximum allowable rise of its output signal per unit of time.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *and limiting said filtering step in response to the result of said filtering step* of Etter into Cason and Hoya, since Cason and Hoya suggest a filter to estimate noise (something broad) in general, and Etter suggests the beneficial use of a limiter such as

to estimate noise more accurately (Etter, column 13, lines 31-33) in the analogous art of noise suppression in telecommunications.

9. As per claim 10, Cason, Hoya and Etter teaches claim 8. Cason also teaches *said filtering step is adapted to extract said offset component* (Cason, figure 1, element 15 is the offset component extracted from filter 14 and shown as signal $y_1(t)$ in figure 2). Etter teaches *said limitation step comprises the steps of comparing the extracted offset component with the level of said communication signal* (Etter, figure 3, element 205) *and selecting one of said extracted offset component and said level of said communication signal in response to the comparing result* (Etter, figure 3, elements 217 and 215 select the input communication signal as the final noise estimate, while elements 207, 209, 211 and 215 select the noise estimate extracted from the limitation filter in figure 2 as the final noise estimate, depending on the output of comparing means 205).

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cason (US Patent 6,249,757) in view of Hoya (US 2004/0054528A1) and Etter (US patent 7,072,831) as applied to claim 6 above, and further in view of Bellanger (Acoustics, Speech, and Signal Processing, IEEE International Conference on ICASSP '85. Volume 10, Apr 1985 Pages 1153-1156.)

11. As per claim 7, Cason, Hoya and Etter teach claim 6. Cason also teaches *within the limitation of predetermined parameter values* (Cason, column 5, lines 41-45 teaches why the time constant of the filters should be limited, and lines 52-53 teaches a predetermined range for the filter parameter.)

Cason, Hoya and Etter do not teach *said parameter control means is adapted to apply an exponential adaptation of said filter parameter*. However, Bellanger teaches *said parameter control means is adapted to apply an exponential adaptation of said filter parameter* (Bellanger , abstract, teaches the use of the exponential estimation technique to adjust the coefficient adaptation step size of a filter.) Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement *said parameter control means is adapted to apply an exponential adaptation of said filter parameter* of Bellanger into Cason, Hoya and Etter, since Cason, Hoya and Etter suggest an adaptive filter for noise estimation (something broad) in general, and Bellanger suggests the beneficial use of applying an exponential adaptation to that filter such as to better follow rapid changes in the signal (Bellanger, section 2, first paragraph) in the analogous art of speech processing.

## *Allowable Subject Matter*

12. Claims 4 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

## *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THUAN NGUYEN whose telephone number is (571)270-7189. The examiner can normally be reached on 7:30 AM to 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pankaj Kumar can be reached on 571-272-3011. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

T.N.

/ROBERT WILSON/
Primary Examiner, Art Unit 2419